

TEST DESCRIPTION

FOR DEMONSTRATING JMCIS ON-LINE SERVICES AT CINCPACFLT AND SELECTED PACIFIC FLEET SHIP(S)

(Short Title: JMCIS On-Line Services Test Description)
(JOSTED)

(Work in Progress Draft)

16 January 1997

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San Diego, CA 92152-5001

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EXECUTIVE SUMMARY

The Joint Maritime Command Information System (JMCIS) is produced and operated in an evolutionary development environment. As a result, JMCIS is constantly undergoing changes. These changes are installed on geographically diverse operational systems serving operational and administrative commanders on a nearly continuous basis. These changes have required associated services (such as configuration management, software installation, and testing). Traditionally, these services have been provided at the JMCIS site, ashore and afloat.

This report describes testing required to expand the JMCIS service concept to include services provided On-Line between the JMCIS Development Facility at the Naval Command, Control and Ocean Surveillance Center (NCCOSC) Research, Development, Test & Evaluation Division (NRaD) and the JMCIS site, ashore and afloat. Testing will be conducted in four phases:

- Machine to Machine at NRaD (with connectivity internal to NRaD)
- Machine to Machine at NRaD (with connectivity external to NRaD)
- Machine (server) at NRaD to Remote Machine(s) (client) at the JMCIS suite serving Commander in Chief, U. S. Pacific Fleet (CINCPACFLT)
- Machine (server) at NRaD to Remote Machine(s) (client) on a Pacific Fleet Ship (TBD).

Testing requirements are specified in terms of two services ...remote configuration sensing and remote software (patch) install. Minimum required testing (in terms of certifying successful completion of a demonstration phase) is specified in terms of two test sequences:

- Remote Configuration Sensing of a Single Machine with Continuous Communications (1RC)
- Posted Remote Install (Patch) of a Small Patch with Continuous Communications (PSC)

Additional test sequences of special testing interest are specified. Of particular interest, is the effect of a communications outage on the quality and utility of On-Line services. Test sequences with continuous communications (as the two minimum requirements introduced above) have a designation ending in "C". Test sequences with communications outages have a designation ending in "O". Thus sequence 1RO tests remote configuration sensing of a single machine with communications outages.

This test description envisions the demonstration of On-Line services using one or more commercial-off-the-shelf (COTS) enterprise management software products. The current version of the test description provides information on two such products...Computer Associates (CA) UNICENTER and Tivoli Management Environment, Release 10 (TME 10) . The structure of this test description supports testing of additional COTS products.

Upon successful completion of the tests described in this report, a demonstration facility will be established at NRD to manage the transition from phased demonstration of selected On-Line services to implementation of customer focused On-Line services at selected JMCIS/GCCS (Global Command and Control System) sites, ashore and afloat.

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SECTION 1 - SCOPE

1.1 IDENTIFICATION

This Joint Maritime Command Information System (JMCIS) On-Line Services Test Description (JOSTED) describes the qualification testing to be performed during the phased demonstration of JMCIS on-line services. This testing shall be performed to:

- a. Demonstrate the feasibility and utility of providing JMCIS on-line services under a variety of connectivity conditions.
- b. Evaluate and compare the effectiveness of various commercial-off-the-shelf (COTS) enterprise management tools to provide specified on-line services. This version of the JOSTED identifies two such products: Computer Associates (CA) UNICENTER and Tivoli Management Environment Release 10 (TME 10). Two services (involving remote configuration sensing and remote software (patch) install) are specified in Section 3 of this Test Description. The testing structure specified in this version of the JOSTED supports the testing of additional COTS products and additional services.
- c. Support the establishment of a demonstration facility at NRaD that will manage the transition from phased demonstration of selected on-line services at pilot sites, ashore and afloat, to implementation of customer focused on-line services at selected JMCIS/GCCS (Global Command and Control System) sites, ashore and afloat.

1.2 SYSTEM OVERVIEW

JMCIS consists of two elements: JMCIS Afloat, which developed out of the Naval Tactical Command System-Afloat (NTCS-A) and JMCIS Ashore, which developed out of the Operations Support System (OSS). JMCIS is produced and operated in an evolutionary development environment. As a result, JMCIS is constantly undergoing changes. These changes are installed on geographically diverse operational systems serving operational and administrative commanders on a nearly continuous basis. These changes have required associated services (such as configuration management, software installation, and testing). Traditionally, these services have been provided at the JMCIS site, ashore and afloat.

This report describes testing required to expand the JMCIS service concept to include services provided On-Line between the JMCIS Development Facility at the Naval Command, Control and Ocean Surveillance Center (NCCOSC) Research, Development, Test & Evaluation Division (NRaD) and the JMCIS site, ashore and afloat. Testing will be conducted in four phases:

- Machine to Machine at NRaD (with connectivity internal to NRaD) (Figure 1)
- Machine to Machine at NRaD (with connectivity external to NRaD) (Figure 2)
- Machine (server) at NRaD to Remote Machine(s) (client) at the JMCIS suite serving Commander in Chief, U. S. Pacific Fleet (CINCPACFLT) (Figure 3)
- Machine (server) at NRaD to Remote Machine(s) (client) on a Pacific Fleet Ship (TBD) (Figure 4).

1.3 DOCUMENT OVERVIEW

This document describes the testing to be performed during the phased demonstration of JMCIS On-Line services. This JOSTEP has been developed using DI-IPSC-81439 (Software Test Description (STD)) as a guideline. The format of this data item description was modified to reflect the nature of this testing which, while based in software, also involves JMCIS Wide Area Network Support (JWANS) connectivity, order wire communications and test processes at multiple sites.

- Section One introduces the concept of JMCIS On-Line Services and describes a phased demonstration approach.
- Section Two provides a list of documents referenced by this JOSTEP.
- Section Three describes test preparations.
- Section Four contains a description of each test.
- Section Five provides traceability between planned tests and special requirements.
- Section Six provides notes including an acronym listing and terms and definitions needed to understand the information presented in this report.

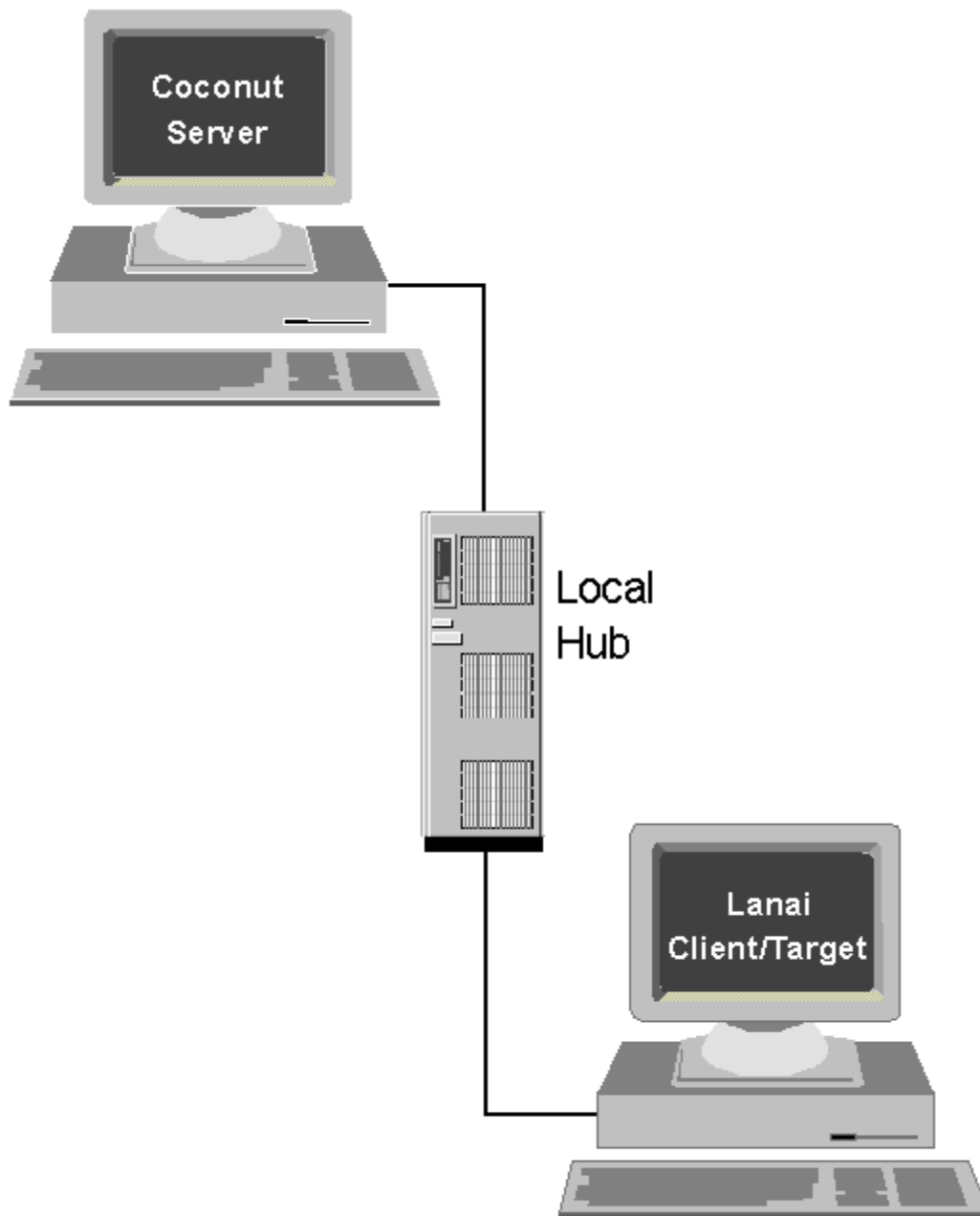


Figure 1 - Phase 1 Components and Connectivities

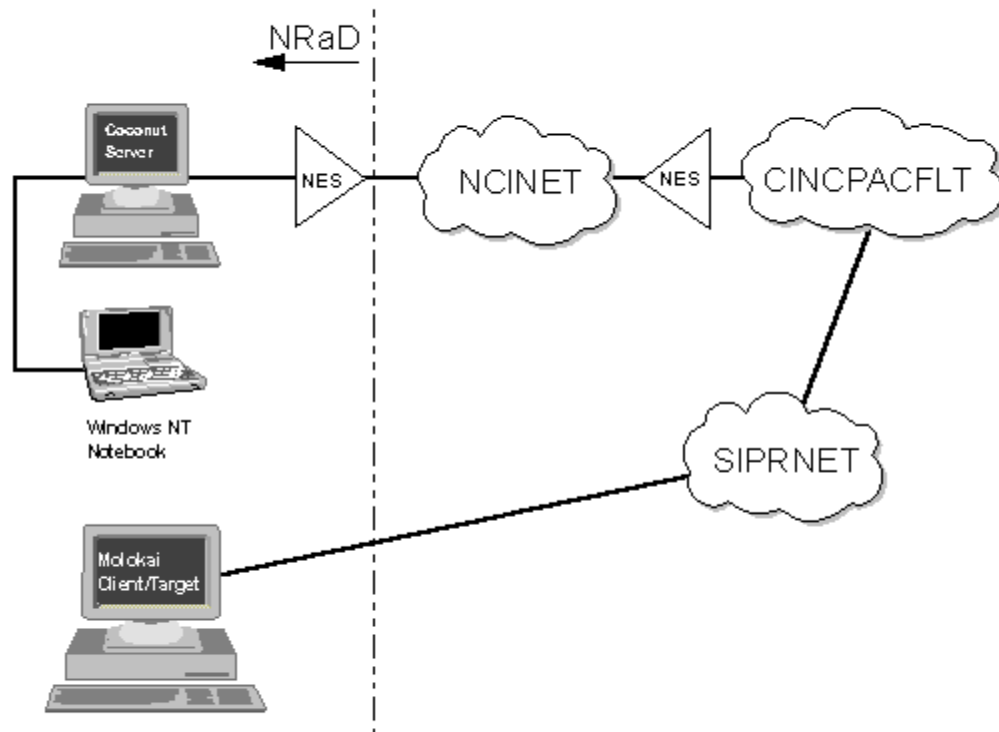


Figure 2 - Phase 2 Components and Connectivities

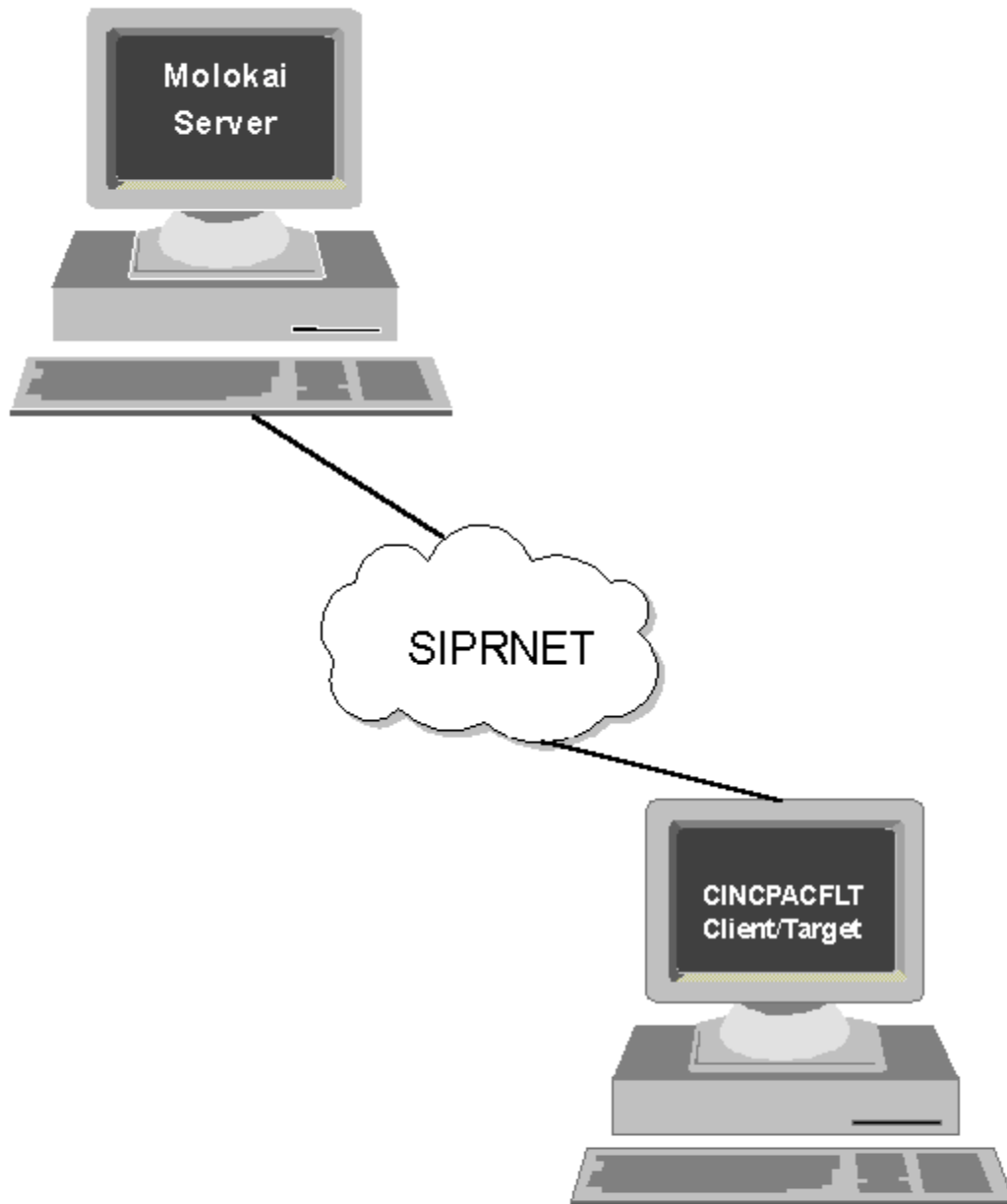


Figure 3 - Phase 3 Components and Connectivities

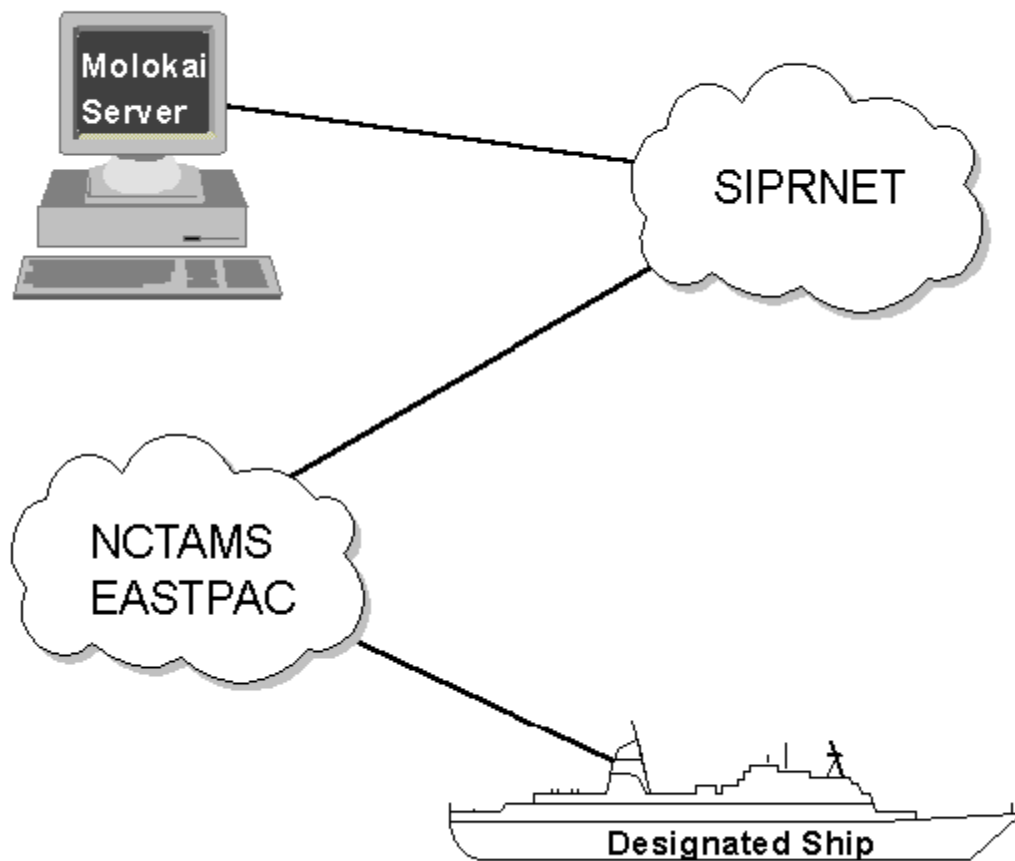


Figure 4 - Phase 4 Components and Connectivities

1.4 TESTING OVERVIEW

1.4.1 TEST STRUCTURE TERMINOLOGY

(1) Test Phase. There are four Phases based on connectivity and site configurations.

(2) Test Event. For any test phase, one or more test events may be scheduled. A test event is a block of time during which resources are allocated for testing purposes. During this block of time, the Test Director may conduct one or more test sequences or, equivalently, run the same sequence more than once with or without changing parameters (such as the size of a remote posting patch).

(4) Test Sequence. A sequence of test cases that, taken together, fulfills a specific test requirement. Minimum test sequence requirements are described in Section 3 (see Table 1).

(5) Test Cases. The building blocks of our test plan. Specific test cases will be defined and integrated into a test sequence as necessary to fulfill testing requirements at each site and for each phase.

1.4.2 MINIMUM TEST SEQUENCE REQUIREMENTS

a. Remote Configuration Sensing

(1) Test Sequence 1RC. Remote configuration sensing of one machine with **continuous** communications.

(2) Test Sequence 1RO. Remote configuration of one machine with communications **outages**.

b. Posted Install

(1) Test Sequence PSC. Posted install of one small patch with **continuous** communications.

(2) Test Sequence PSO. Posted install of one small patch with communications **outages**.

Test Sequences 1RC and PSC represent the minimum testing requirements for each phase. These test sequences demonstrate basic on-line services. Test sequences with project unique designators ending with the letter "C" are performed with continuous communications.

Test Sequences 1RO & PSO represent "damage control" testing in which communications outages are experienced. Test sequences with project unique designators ending with the letter "O" are performed with communications outages imposed.

SECTION 2 - REFERENCED DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

The following documents were used as reference during the creation of this test description.

a. DI-IPSC-81439, 5 December 1994, Software Test Description (STD) Data Item Description (DID). This DID supersedes DI-MCCR-800015A, the Software Test Description DID initially specified under Contract N66001-93-D-0014. As discussed in Paragraph 1.3, the format of DI-IPSC-81439 was modified to reflect the nature of this testing which, while based in software, also involves JMCIS Wide Area Network Support (JWANS) connectivity, order wire communications and test processes at multiple sites.

b. **Test** Plan for Demonstrating JMCIS On-Line Services at CINCPACFLT and Selected Pacific Fleet Ship(s) (Short Title: JMCIS On-Line Services Test Plan (JOSTEP)), Work in Progress Draft, 16 December 1996

c. **Implementation** Plan for Demonstrating JMCIS On-Line Services at CINCPACFLT and Selected Pacific Fleet Ship(s) (Short Title: JMCIS On-Line Services Demonstration Plan (JOSDEP)), dated 29 February 1996.

d. JMCIS Wide Area Network Report, dated 30 September, 1995.

2.2 NON-GOVERNMENT DOCUMENTS

a. Tivoli TME 19 Distributed Systems Management Proposal for JMCIS On-Line Services, October 30, 1996.

b. CA UNICENTER Technical Information.

SECTION 3 - TEST PREPARATIONS

3.0 TEST PREPARATIONS OVERVIEW

Testing shall be conducted in four phases, as described in Paragraph 1.4. Each test phase consists of a series of test sequences. Each test sequence has a project unique identifier. The following test sequences are described in this Section. Additional test sequences are described in Paragraph 5.1

a. Remote Configuration Sensing

(1) **1RC**. Remote configuration sensing of one machine with **continuous** communications.

(2) **1RO**. Remote configuration of one machine with communications **outages**.

b. Posted Install

(1) **PSC**. Posted install of one small patch with **continuous** communications.

(2) **PSO**. Posted install of one small patch with communications **outages**.

Test Sequences 1RC and PSC represent the minimum testing requirements for each phase. These test sequences demonstrate basic on-line services. Test sequences with project unique designators ending with the letter "C" are performed with continuous communications.

Test Sequences 1RO & PSO represent "damage control" testing in which communications outages are experienced. Test sequences with project unique designators ending with the letter "O" are performed with communications outages imposed.

The complete project unique identifier for a test sequence consists of the above designator followed by the phase number in parentheses. Thus: 1RO(1) is test sequence 1RO in Phase 1; PSO(3) is test sequence PSO in Phase 3. A complete listing of these project unique identifiers is provided in Table 1.

Table 1 - Project Unique Identifiers

Generic	1RC	1RO	PSC	PSO
Phase 1	1RC(1)	1RO(1)	PSC(1)	PSO(1)
Phase 2	1RC(2)	1RO(2)	PSC(2)	PSO(2)
Phase 3	1RC(3)	1RO(3)	PSC(3)	PSO(3)
Phase 4	1RC(4)	1RO(4)	PSC(4)	PSO(4)

Phase unique parenthetical notation is used (in this Test Description and throughout the test program) when necessary to differentiate between test phases; otherwise, it is omitted (i.e., the generic 1RC, 1RO, PSC, PSO is used).

Additional test sequences (including test sequences involving the use of a Windows NT machine as a client) are defined as special test requirements in Paragraph 5.1.

3.1 PHASE 1 TEST PREPARATIONS

Brief Description. Phase 1 testing involves machine to machine at NRaD with connectivity internal to NRaD.

Project Unique Identifiers. Test sequences 1RC(1), 1RO(1), PSC(1), PSO(1).

The minimum test requirement for Phase 1 are:

- a. Either test sequence 1RC(1) or 1RO(1); plus
- b. Either test sequence PSC(1) or PSO(1).

If possible, all four test sequences shall be performed. Additional test sequences, as defined in Paragraph 5.1, may be performed at the discretion of the Test Director, consistent with the availability of testing resources.

3.1.1 PHASE 1 HARDWARE PREPARATION

- a. Specific Hardware
 - (1) Server (at NRaD). Coconut.
 - (2) Remote Client Machine (at NRaD). Lanai.
 - (3) Hub (at NRaD).

b. Switch Settings and Cabling Necessary to Connect the Hardware. Coconut (the TMR Server) is connected by cable to a local hub. Lanai (the TMR managed node) is connected by cable to the same hub.

c. Hardware, Interconnecting Control, and Data Paths. See Figure 1.

d. Step-by-Step Instructions for Placing the Hardware in a State of Readiness.

(1) Verify cable connections.

(2) Verify hub settings.

(3) Turn on (or verify already turned on) Coconut.

(4) Turn on (or verify turned on) Lanai.

3.1.2 PHASE 1 SOFTWARE PREPARATION

a. Specific Software. CA UNICENTER (CAU) and Tivoli Management Environment (TME).

b. Storage Medium of Item Under Test. Hard disk drive logically segmented between CAU and TME.

c. Storage Medium of Any Related Software. Not applicable.

d. Instruction for Loading the Software, Including Required Sequencing. CAU and TME are already loaded at NRaD.

e. Instructions for Software Initialization Common to More than one Test Sequence.

The following test sequences have common initialization instructions: 1RC and 1RO. PSC and PSO.

(1) CAU is initialized by selecting the CA UNICENTER icon.

(2) TME is initialized by selecting the Tivoli Management Environment icon.

3.1.3 OTHER PHASE 1 PREPARATIONS

- a. Verify availability of required personnel for scheduled test event time block.
- b. Verify hardware availability for scheduled test event time block.
- c. Verify loading (network and target CPU) measurement devices in place and operational.

3.2 PHASE 2 TEST PREPARATIONS

Brief Description. Phase 2 testing involves machine to machine at NRaD with connectivity external to NRaD.

Project Unique Identifiers. Test sequences 1RC(2), 1RO(2), PSC(2), PSO(2).

The minimum test requirement for Phase 2 are:

- a. Either test sequence 1RC(2) or 1RO(2); plus
- b. Either test sequence PSC(2) or PSO(2).

If possible, all four test sequences shall be performed. Additional test sequences, as defined in Paragraph 5.1, may be performed at the discretion of the Test Director, consistent with the availability of testing resources.

Phase 2 includes the use of a Windows NT machine to test (on an optional basis) on-line service concepts using Windows NT clients. Test sequences that the Test Director may employ include:

- 1RWC & 1RWO. Remote configuration sensing of a Windows NT machine (1RWC with continuous communications; 1RWO with communications outages).
- PWSC & PWSO. Posted install of a software patch on a Windows NT machine (PWSC with continuous communications; PWSO with communications outages).

3.2.1 PHASE 2 HARDWARE PREPARATION

- a. Specific Hardware
 - (1) Server (at NRaD). Coconut.
 - (2) Windows NT on LAN with Server (at NRaD). Toshiba Laptop.

(2) Remote Machine (at NRaD). Molokai.

(3) Motorola Improved Network Encryption System (NES). One NES at NRaD linking Coconut machine to NCCOSC Command Internet (NCI) and one NES in Hawaii (at CINCPACFLT) between NCI and the SIPRNET (going back to Molokai machine at NRaD).

b. Switch Settings and Cabling Necessary to Connect the Hardware. Coconut (the Server) is connected to a LAN (referred to as the NES LAN) with the Windows NT Notebook. This LAN is connected to an NES at NRaD. Molokai (the client) is connected to SIPRNET at NRaD.

c. Hardware, Interconnecting Control, and Data Paths. See Figure 2.

d. Step-by-Step Instructions for Placing the Hardware in a State of Readiness

(1) Verify cable connections.

(2) Turn on (or verify already turned on) Coconut (server) on NRaD LAN.

(3) Turn on (or verify already turned on) Windows NT Notebook on NRaD LAN.

(4) Turn on (or verify already turned on) Molokai (client) at NRaD.

(5) Turn on (or verify already turned on) NESs:

(a) At NRaD.

(b) At CINCPACFLT.

3.2.2 PHASE 2 SOFTWARE PREPARATION

a. Specific Software. CA UNICENTER (CAU) and Tivoli Management Environment (TME).

b. Storage Medium of Item Under Test. Hard disk drive logically segmented between CAU and TME.

c. Storage Medium of Any Related Software. Not applicable.

d. Instruction for Loading the Software, Including Required Sequencing. CAU and TME are already loaded at NRaD.

e. Instructions for Software Initialization Common to More than one Test Sequence. See Paragraph 3.1.2.e.

3.2.3 OTHER PHASE 2 PREPARATIONS

- a. Verify availability of required personnel for scheduled test event time block.
- b. Verify hardware availability for scheduled test event time block.
- c. Verify loading (network and target CPU) measurement devices in place and operational.
- d. Verify Phase 2 connectivity.

3.3 PHASE 3 TEST PREPARATIONS

Brief Description. Phase 3 testing involves a JMCIS On-Line Services server at NRaD and a JMCIS machine at CINCPACFLT.

Project Unique Identifiers. Test sequences 1RC(3), 1RO(3), PSC(3), PSO(3).

The minimum test requirement for Phase 3 are:

- a. Either test sequence 1RC(3) or 1RO(3); plus
- b. Either test sequence PSC(3) or PSO(3).

If possible, all four test sequences shall be performed. Additional test sequences, as defined in Paragraph 5.1, may be performed at the discretion of the Test Director, consistent with the availability of testing resources.

3.3.1 PHASE 3 HARDWARE PREPARATION

- a. Specific Hardware

(1) Server (at NRaD). Molokai.

(2) Remote Client Machine (at CINCPACFLT). G355. IP 198.55.2.195. Configured with JMCIS 3.1. 232 MB free disk space and 64MB memory (HP 730). Close to desk of Mr. Robert Trankle. Connected to server over SIPRNET.

b. Switch Settings and Cabling Necessary to Connect the Hardware. Molokai is connected to SIPRNET at NRaD. Remote machine is connected to SIPRNET at CINCPACFLT.

c. Hardware, Interconnecting Control, and Data Paths. See Figure 3.

d. Step-by-Step Instructions for Placing the Hardware in a State of Readiness

(1) Verify cable connections.

(2) Turn on (or verify already turned on) Molokai (server) at NRaD.

(3) Turn on (or verify already turned on) remote machine(client) at CINCPACFLT.

(5) Turn on (or verify already turned on) SIPRNET connections:

(a) At NRaD.

(b) At CINCPACFLT.

3.3.2 PHASE 3 SOFTWARE PREPARATION

a. Specific Software. CA UNICENTER (CAU) and Tivoli Management Environment (TME).

b. Storage Medium of Item Under Test. Hard disk drive logically segmented between CAU and TME.

c. Storage Medium of Any Related Software. Not applicable.

d. Instruction for Loading the Software, Including Required Sequencing. CAU and TME are already loaded at NRaD. Appropriate segments of CAU and TME must be loaded into the CINCPACFLT machine, either directly at CINCPACFLT or remotely (using on-line service connectivity) from the server at NRaD.

e. Instructions for Software Initialization Common to More than one Test Sequence. See Paragraph 3.1.2.e.

3.3.3 OTHER PHASE 3 PREPARATIONS

a. Verify availability of required personnel for scheduled test event time block.

(1) At NRaD

(2) At CINCPACFLT.

b. Verify hardware availability for scheduled test event time block.

(1) At NRaD

(2) At CINCPACFLT.

c. Verify loading (network and target CPU) measurement devices in place and operational.

(1) At NRaD

(2) At CINCPACFLT.

d. Verify Phase 3 connectivity.

3.4 PHASE 4 TEST PREPARATIONS

Brief Description. Phase 4 testing involves a JMCIS On-Line Services server at NRaD and a JMCIS machine afloat.

Project Unique Identifiers. Test sequences 1RC(2), 1RO(2), PSC(2), PSO(2).

The minimum test requirement for Phase 2 are:

a. Either test sequence 1RC(2) or 1RO(2); plus

b. Either test sequence PSC(2) or PSO(2).

If possible, all four test sequences shall be performed. Additional test sequences, as defined in Paragraph 5.1, may be performed at the discretion of the Test Director, consistent with the availability of testing resources.

3.4.1 PHASE 4 HARDWARE PREPARATION

a. Specific Hardware

(1) Server (at NRaD). Molokai.

(2) Remote Machine (on designated ship). Connected to server over Naval Computer and Telecommunications Area Master Station (NCTAMS) Eastern Pacific (EASTPAC) Standard Tactical Entry Point (STEP) and SIPRNET.

- b. Switch Settings and Cabling Necessary to Connect the Hardware.
- c. Hardware, Interconnecting Control, and Data Paths. See Figure 4.
- d. Step-by-Step Instructions for Placing the Hardware in a State of Readiness.

(1) Verify cable connections.

(2) Turn on (or verify already turned on) Molokai (server) at NRaD.

(3) Turn on (or verify already turned on) remote machine(client) at ship.

(5) Turn on (or verify already turned on) connections:

(a) At NRaD.

(b) At intermediate points (such as NCTAMS EASTPAC).

(c) At ship.

3.4.2 PHASE 4 SOFTWARE PREPARATION

a. Specific Software. CA UNICENTER (CAU) and Tivoli Management Environment (TME).

b. Storage Medium of Item Under Test. Hard disk drive logically segmented between CAU and TME.

c. Storage Medium of Any Related Software. Not applicable.

d. Instruction for Loading the Software, Including Required Sequencing. CAU and TME are already loaded at NRaD. Appropriate segments of CAU and TME must be loaded into the designated ship machine, either directly at the ship or remotely (using on-line service connectivity) from the server at NRaD.

e. Instructions for Software Initialization Common to More than one Test Sequence. See Paragraph 3.1.2.e.

3.4.3 OTHER PHASE 4 PREPARATIONS

- a. Verify availability of required personnel for scheduled test event time block
 - (1) At NRaD
 - (2) At intermediate points (such as NCTAMS EASTPAC).
 - (3) At ship.
- b. Verify hardware availability for scheduled test event time block.
 - (1) At NRaD
 - (2) At intermediate points (such as NCTAMS EASTPAC).
 - (3) At ship.
- c. Verify loading (network and target CPU) measurement devices in place and operational.
 - (1) At NRaD
 - (2) At intermediate points (such as NCTAMS EASTPAC).
 - (3) At ship.
- d. Verify Phase 4 connectivity.

SECTION 4 - TEST DESCRIPTIONS

4.0 TEST OVERVIEW

a. Test Structure Terminology

Test structure terminology is introduced in Paragraph 1.4. It is repeated here for ease of reference.

(1) Test Phase. There are four phases based on connectivity and site configurations.

(2) Test Event. For any test phase, one or more test events may be scheduled. A test event is a block of time during which resources are allocated for testing purposes. During this block of time, the Test Director may conduct one or more test sequences or, equivalently, run the same sequence more than once with or without changing parameters (such as the size of a remote posting patch).

(4) Test Sequence. A sequence of test cases that, taken together, fulfills a specific test requirement. Minimum test sequence requirements are described in Paragraph 3.0 (see Table 1).

(5) Test Cases. The building blocks of our test plan. Software test cases are often developed by software product vendors. Specific test cases will be defined and integrated into a test sequence as necessary to fulfill testing requirements at each site and for each phase.

b. Test Event Scheduling

For any given block of time allocated to testing (i.e., a test event), the general steps listed in Table 2 are utilized.

Steps 1 through 5 are preparatory steps prior to the actual provision of a test sequence based on-line service.

Step 6 is a test sequence based on-line service module. It is here where a particular on-line test sequence (for example, 1RC, is run. In Table 2, Step 6 is a generic template, illustrating a general approach. In Tables 3 and 4 test sequence based steps for 1RC/1RO & PSC/PSO, respectively are provided.

In Step 7, the Test Director terminates the On-Line Service Session). At this stage, the Test Director may elect to:

- initiate another on-line service session (Step 4), particularly if communications have been lost,
- continue with another test sequence based on-line service module (another run through Step 6, not necessarily with the same test sequence), particularly if communications have been restored,
- or terminate the test event (Step 8).

Additional descriptions of each step follow:

Step 1. Preparations for Phases 1, 2, 3, & 4 in accordance with test preparations specified in Paragraphs 3.1, 3.2, 3.3, & 3.4, respectively.

Step 2. Observe and record pre test condition (e.g., hardware and/or software configuration of target machine) as required to assess the particular service planned for Step 6. For 1RC & 1 RO, this involves hardware and software to the level of detail sensed by the remote sensing tool, as scripted for the test. For PSC & PSO, this involves the software configuration of the target machine. Although this data may not be critical for a simple posting, it will be important in cases where actual software installation (and perhaps deinstallation) is performed, either subsequent to the posting service or as an actual part of an on-line service session.

Steps 3, 5, 6.3, & 6.6.

Regarding Network Loading: There are (at least) three “networks” of interest: (1) the server’s network (sometimes referred to as the NES Network), the “long-haul” network (e.g., SIPRNET in Phase 3), and the network serving the target machine. The principal focus of these steps is the loading of the network serving the target machine. The method of measuring this loading will vary with each target machine network. IP accounting has been activated at NRaD on the red CISCO router. This enables documentation of SIPRNET usage during testing. A similar approach may be employed on target LANs employing CISCO routers.

Regarding target machine CPU Loading: The ability to measure CPU loading will depend on the specific target machine involved.

Table 2 - Sequential Test Step Template

Step		Action
1		Verify Phase Test Preparations Completed
2		Observe & Record (O&R) Pretest Condition of the Target Machine
3		O&R Loading Immediately Before Initiation of On-Line Service Session
	3.1	O&R Network Loading
	3.2	O&R Target Machine CPU Loading
4		Initiate On-Line Service (OLS) Session
5		O&R Loading Immediately Before Providing On-Line Service
	5.1	O&R Network Loading
	5.2	O&R Target Machine CPU Loading
Generic Test Sequence Based On-Line Service Module (Start)		
6		<u>Provide On-Line Service</u>
		<ul style="list-style-type: none"> • Remote Sensing of Target Machine Configuration (1RC or 1RO) • Posted Install of One Small Patch (PSC pr PSO) • etc.
	6.1	Commence On-Line Service (e.g., Remote Sensing or Posted Install)
	6.2	O&R Start Time
	6.3	O&R Loading During Service <ul style="list-style-type: none"> • Network Loading • Target Machine CPU Loading
	6.4	Complete On-Line Service
	6.5	O&R Finish Time
	6.6	O&R Loading Immediately After Service <ul style="list-style-type: none"> • Network Loading • Target Machine CPU Loading
	6.7	O&R Tool Derived Configuration of Target Machine at Target Machine
	6.8	O&R Tool Derived Configuration of Target Machine at Server
	6.9	Compare 6.8 and 6.9
Generic Test Sequence Based On-Line Service Module (End)		
Communications Outage Module (Start) (Nominal Insertion Point between Sub-steps 6.1 and 6.5)		
O		Interrupt Communications
	O.1	Insert/Experience Communications Outage
	O.2	O&R Operator Indications of Communications Outage
	O.3	O&R Any Unsuccessful Attempts to Reestablish Communications
	O.4	Reestablish Communications
	O.5	O&R Operator Indications of Reestablished Communications
	O.6	Return to Step 4, 6, or 8.
Communications Outage Module (End)		
7		Terminate On-Line Service Session
8		Terminate Test Event

Step 4. Initiate an on-line service session between the server and target machine(s) using the product under evaluation. This step

- “brings up” whatever software is required for the session and
- establishes connectivity.

The first time this step is performed, it may involve remote installation (from the server to the target(s)) of software segments of the product under evaluation. This step may also involve the initiation of test “order wire” communications, particularly for Phases 3 and 4. No tested services, per se, are performed during this step.

Generic Test Sequence Based On-Line Service Module

Step 6. Provide an On-Line Service.

This step involves the actual provision (and testing) of an on-line service. As such, step 6 is a test sequence based “module” that can be tailored for specific services. Step 6 in Table 3 specifies the sub-steps associated with remote sensing (1RC & 1RO). Step 6 in Table 4 specifies the steps associated with a posted install of one small patch (PSC & PSO). In any given on-line service session (initiated in Step 4 and terminated in Step 7 (and perhaps Sub-step O.6...see below)), the same test sequence based Step 6 may be repeated more than once, either with the same parameters or parameters modified as specified by the Test Director (e.g., Step 6 for PSC & PSO may be repeated with different size patches). Additional test sequence based testing requirements (such as the special requirements described in Paragraph 5.1) may be inserted as Step 6 modules. As mentioned above, the nature of the conditions observed and recorded in Step 2 is dependent on the test sequence based service “module” planned for Step 6.

Sub-step 6.1. Commence Specified Service. This is typically initiated by selecting a menu item from the product under evaluation.

Sub-steps 6.2 and 6.5. Observe and record start and finish times. The actual measurement of these times will be dependent on the product under evaluation. The focus of this time keeping is when the service is “on-line”. Off-line activities (such as completing a “pre-send” dialog box) should not be included in the “on-line” service time. Timing services provided by the product may be used but shall be verified (when possible) using observer generated time marks.

Sub-steps 6.7 and 6.8 involve observations of the results of a “service” (for example, a configuration listing) at the target and server respectively. The comparison of these observations (Sub-step 6.9) should be done as part of the test if possible. For example, in Phase 3 and 4, the files that will be sent from the server to the target for PSC and PSO may be provided (perhaps on a disk) to the remote site in advance (perhaps carried by an observer to the remote site) for an automated file comparison of the prepositioned files with the files received as a result of the on-line service. Note that comparison of the results of Sub-steps 6.7 and 6.8 (in Sub-step 6.9) highlights the fidelity of the on-line service; whereas, a comparison of, say, actual hardware and software configuration of the target machine (Step 2 in Tables 1 and 3) with Tool

derived configuration of target machine at server (Step 6.8) highlights both the fidelity of the on-line service and the fidelity of the tool.

Communications Outage Module

Communications outages can happen any time during an on-line service session; that is, anytime between Step 4 and Step 7. The communications outages of interest for the tests described in this report are those that happen during an actual Service Module (Step 6); specifically, sometime between the commencement of the service (Sub-step 6.1) and the completion of the service (Step 7). The test process described in this report can accommodate communications outages that occur at other steps in the sequence.

Specific communications outage sub-tests are discussed below:

Sub-step O.1. Insert/Experience a Communications Outage.

In a controlled test environment, communications outages will be inserted using a replicatable script initiated at the server. For any phase, more than one script may be used to investigate different communications failure modes. As a minimum, a total outage lasting at least one minute shall be inserted. In different phases, different scripts may be required to accommodate the different connectivities involved. In Phases 3 & 4, additional communications outage scripts may be inserted at CINCPACFLT, the designated ship, or an intermediary facility (such as NCTAMS EASTPAC). In this case, the scripts will be approved by the Command involved and the Test Director. Initiation of a communications outage from a location other than NRaD will be under the control of the appropriate command (with Test Director concurrence).

In addition to the controlled insertion of scripted communications outages, unplanned communications outages may be experienced over the course of the tests described in this report. When such outages are experienced, the Test Director (and designated test personnel) shall attempt to observe and record the resulting process in a manner similar to the response to a scripted outage. Thus, the following sub-steps (O.2 through O.6) are applicable to both planned (inserted) and unplanned (experienced) communications outages.

Sub-step O.6. Return to Step 4, 6, or 8

Depending on the severity of the communications outage, the test sequence may return to either Step 4 (Initiate On-Line Service Session...i.e., the outage terminated the session) or Step 6 (Provide an On-Line Service)...i.e., the outage did not terminate the session). In either case, it is noted (by the Test Director and designated test personnel) that a communications outage has been experienced and a decision is made whether or not additional scripted outages will be inserted during the remainder of the on-line service session. In some cases (such as a severe

unplanned outage), a communications outage may cause the Test Director to proceed to Step 8 ((Unsuccessfully) Complete the Test Sequence). This sequence may be rescheduled consistent with test resource constraints. As previously specified, the minimum test sequences required for each phase are 1RC (or, equivalently, 1RO) and PSC (or, equivalently, PSO).

4.1 PHASE 1 TEST DESCRIPTION

Phase 1 involves testing machine to machine at NRaD with connectivity internal to NRaD.

4.1.1 REMOTE CONFIGURATION SENSING OF ONE MACHINE (1RC(1) & 1RO(1))

4.1.1.1 1RC(1) & 1RO(1) REQUIREMENTS ADDRESSED

Remote configuration of target machine configuration (hardware and software) with continuous communications 1RC(1) and with communications outages 1RO(1).

4.1.1.2 1RC(1) & 1RO(1) PREREQUISITE CONDITIONS

This paragraph identifies prerequisite conditions that must be established prior to performing 1RC(1) & 1RO(1) test sequences.

- a. Hardware & Software Configuration. As per Paragraph 3.1.
- b. Flags, Initial Breakpoints, Pointers, Control Parameters, or Initial Data to be Set/Reset Prior to Test Commencement. Step 2, Table 2. For 1RC & 1 RO, this involves hardware and software to the level of detail sensed by the remote sensing tool, as scripted for the test.
- c. Preset Hardware Conditions or Electrical States Necessary to Run The Test Sequence. Server and Client (target) machines turned on with appropriate software product selected. Phase 1 connectivity established.
- d. Initial Conditions to be Used in Making Timing Measurements. Observe and record start and finish times. The actual measurement of these times will be dependent on the product under evaluation. The focus of this time keeping is when the service is "on-line". Off-line activities (such as completing a "pre-send" dialog box) should not be included in the "on-line" service time. Timing services provided by the

product may be used but shall be verified (when possible) using observer generated time marks.

e. Conditioning of the Simulated Environment. Not Applicable.

f. Other Special Conditions Peculiar to the Test Sequence. Current versions of software products under evaluation support remote sensing of hardware configuration but not remote sensing of software configuration. Accordingly, a script has been developed by members of the test team to perform the remote software sensing function. This script is an interim device used to demonstrate the feasibility of on-line services. As discussed above (under Step 6), the comparison (in Sub-step 6.9) of the results of:

- Sub-step 6.7 (tool derived target machine configuration at target) and
- Sub-step 6.8 (tool derived target machine configuration at server)

highlights the fidelity of the on-line service; whereas, a comparison of, say:

- actual hardware and software configuration of the target machine (Step 2 in Table 2) and
- Tool derived configuration of target machine at server (Step 6.8)

highlights both the fidelity of the on-line service and the fidelity of the tool. At this stage, we are testing the fidelity of on-line services, not the fidelity of an interim tool. Software product vendors state that the next upgrade of their product will provide features for remote software sensing. The testing structure established in this test description supports the future testing of such a feature when it is implemented by the vendor.

4.1.1.3 1RC(1) & 1RO(1) TEST SEQUENCE INPUTS

This paragraph describes the test inputs necessary for 1RC(1) & 1RO(1) test sequences.

a. Name, Purpose, and Description of Test Input. Tool derived hardware and software configuration reported at the target machine. Compared to tool derived hardware and software configuration reported to the server.

b. Source of Test Input and Method to be used for Selecting the Test Input. Software product under evaluation with interim software configuration sensing script.

c. Whether the Test Input is Real or Simulated. Real.

d. Time or Event Sequence of Test Input. As per Table 2.

e. The Manner in Which the Input Data will be Controlled to:

(1) Test the item(s) with a minimum/reasonable number of data types and values. Sequential stepping through Table 2 at the direction of the Test Director.

(2) Exercise the item(s) with a range of valid data types and values that test for overload, saturation, and other "worst case" effects. Not applicable for 1RC and 1RO.

(3) Exercise the item(s) with invalid data types and values to test for appropriate handling of irregular inputs. Not applicable for 1RC and 1RO.

(4) Permit retesting, if necessary. Sequential stepping through Table 2 at the direction of the Test Director.

4.1.1.4 EXPECTED 1RC(1) & 1RO(1) TEST SEQUENCE RESULTS

a. Intermediate Results. Sub-step 6.7. O&R tool derived configuration (hardware and software) of target machine at target machine

b. Final Results. Sub-step 6.8. O&R tool derived configuration (hardware and software) of target machine at server.

4.1.1.5 CRITERIA FOR EVALUATING 1RC(1) & 1RO(1) TEST SEQUENCE RESULTS

a. Range or accuracy over which an output can vary and still be acceptable. In Sub-step 6.9, no discrepancies between observations in Sub-step 6.7 and observations in Sub-step 6.8.

b. Minimum number of combinations or alternatives of input and output conditions that constitute an acceptable test result. Either 1RC or 1RO.

c. Maximum/minimum allowable test duration, in terms of time or number of events. At the direction of the Test Director.

d. Maximum number of interrupts, halts, or other system breaks that may occur. At the direction of the Test Director.

e. Allowable severity of processing errors. As per Paragraph 4.1.1.5.a.

f. Conditions under which the result is inconclusive and re-testing is to be performed. As per Paragraph 4.1.1.5.a.

g. Conditions under which the outputs are to be interpreted as indicating irregularities in input test data, in the test database/data files, or in test procedures. Obvious discrepancies from known hardware configuration of target machine (in either Sub-steps 6.7 or 6.8).

h. Allowable indications of the control, status, and results of the test and the readiness for the next test evolution (phase or sequence). As per Paragraph 4.1.1.5.a.

i. Additional Criteria. None.

4.1.1.6 1RC(1) & 1RO(1) TEST SEQUENCE PROCEDURES

General sequential test steps are listed in Table 2. 1RC & 1RO oriented steps are listed in Table 3.

a. Test Operator Actions and Equipment Operation. Preparations in accordance with Paragraph 3.1. Implement 1RC/1RO in accordance with product software graphical user interface.

b. Expected Result and Evaluation Criteria. Hardware and Software Configuration of Target Machine. Evaluation criteria as per Paragraph 4.1.1.5.a.

c. Actions to Follow in the Event of a Program Stop or Indicated Error. At the direction of the Test Director.

d. Procedures to be used to Reduce and Analyze Test Results. As per Sub-step 6.9. If possible, run an automated comparison between the file derived from Sub-step 6.7 and the file derived from Sub-step 6.8.

4.1.1.7 1RC(1) & 1RO(1) ASSUMPTIONS AND CONSTRAINTS

None.

Table 3 - 1RC & 1RO Specific Steps

Step		Action
2		Observe & Report (O&R) Pretest Hardware and Software Configuration of Target Machine to a Level of Detail Consistent with the Remotes Sensing Tool (as Scripted) to be Used
6		Provide On-Line Service (1RC or 1RO)
	6.1	Commence On-Line Remote Sensing
	6.2	O&R 1RC/1RO Start Time
	6.3	O&R Loading During 1RC/1RO <ul style="list-style-type: none"> • Network Loading • Target Machine CPU Loading
	6.4	Complete 1RC/1RO
	6.5	O&R 1RC/1RO Finish Time
	6.6	O&R Loading Immediately After 1RC/1RO <ul style="list-style-type: none"> • Network Loading • CPU Loading
	6.7	O&R Tool Derived Configuration (Hardware and Software) of Target Machine at Target Machine
	6.8	O&R Tool Derived Configuration (Hardware and Software) of Target Machine at Server
	6.9	Compare 6.7 and 6.8

4.1.2 POSTED INSTALL OF ONE SMALL PATCH (PSC(1) AND PSO(1))

4.1.2.1 PSC(1) & PSO(1) REQUIREMENTS ADDRESSED

Posted install of a small patch with continuous communications PSC(1) and with communications outages PSO(1).

4.1.2.2 PSC(1) & PSO(1) PREREQUISITE CONDITIONS

This paragraph identifies prerequisite conditions that must be established prior to performing PSC(1) & PSO(1) test sequences.

- a. Hardware & Software Configuration. As per Paragraph 3.1.

b. Flags, Initial Breakpoints, Pointers, Control Parameters, or Initial Data to be Set/Reset Prior to Test Commencement. Standardized patch. Note: the Test Director may direct the use of more than one size patch in order to test the effect of patch size on such on-line service considerations as time to post, network loading, etc.

c. Preset Hardware Conditions or Electrical States Necessary to Run The Test Sequence. Server and Client (target) machines turned on with appropriate software product selected. Phase 1 connectivity established.

d. Initial Conditions to be Used in Making Timing Measurements. Observe and record start and finish times. The actual measurement of these times will be dependent on the product under evaluation. The focus of this time keeping is when the service is "on-line". Off-line activities (such as completing a "pre-send" dialog box) should not be included in the "on-line" service time. Timing services provided by the product may be used but shall be verified (when possible) using observer generated time marks

e. Conditioning of the Simulated Environment. Not Applicable.

f. Other Special Conditions Peculiar to the Test Sequence. Initial testing focuses on posting a software patch to a remote machine. Eventually, the on-line service will include the actual installation of a patch from the server to a remote client/target. The test structure of this test description accommodates such a feature.

4.1.2.3 PSC(1) & PSO(1) TEST SEQUENCE INPUTS

This paragraph describes the test inputs necessary for PSC(1) & PSO(1) test sequences.

a. Name, Purpose, and Description of Each Test Input. Software patch(es) specified by the Test Director for posting to a remote machine.

b. Source of Test Input and Method to be used for Selecting the Test Input. Software product under evaluation for posting (eventually direct install) of a patch to a remote machine.

c. Whether the Test Input is Real or Simulated. Real.

d. Time or Event Sequence of Test Input. As per Table 2.

e. The Manner in Which the Input Data will be Controlled to:

(1) Test the item(s) with a minimum/reasonable number of data types and values. Sequential stepping through Table 2 at the direction of the Test Director.

(2) Exercise the item(s) with a range of valid data types and values that test for overload, saturation, and other “worst case” effects. Variable size patches at the direction of the Test Director.

(3) Exercise the item(s) with invalid data types and values to test for appropriate handling of irregular inputs. Determine if product under evaluation has capability to send invalid data types as a software patch. If so, send invalid data type file and observe results.

(4) Permit retesting, if necessary. Sequential stepping through Table 2 at the direction of the Test Director.

4.1.2.4 EXPECTED PSC(1) & PSO(1) TEST SEQUENCE RESULTS

- a. Intermediate Results. Sub-step 6.7: O&R software patch at target machine.
- b. Final Results. Sub-step 6.8: O&R software patch sent from server to target machine. Sub-step 6.9: compare files derived in Sub-steps 6.7 and 6.8.

4.1.2.5 CRITERIA FOR EVALUATING PSC(1) & PSO(1) TEST SEQUENCE RESULTS

- a. Range or accuracy over which an output can vary and still be acceptable. In Sub-step 6.9, no discrepancies between observations in Sub-steps 6-7 and 6.8. The use of automated comparison tools, where feasible, is encouraged.
- b. Minimum number of combinations or alternatives of input and output conditions that constitute an acceptable test result. Either PSC or PSO.
- c. Maximum/minimum allowable test duration, in terms of time or number of events. At the direction of the Test Director.
- d. Maximum number of interrupts, halts, or other system breaks that may occur. At the direction of the Test Director.
- e. Allowable severity of processing errors. As per Paragraph 4.1.2.5.a.
- f. Conditions under which the result is inconclusive and re-testing is to be performed. As per Paragraph 4.1.2.5.a.
- g. Conditions under which the outputs are to be interpreted as indicating irregularities in input test data, in the test database/data files, or in test procedures. If, under the provisions of Paragraph 4.1.2.3.e.(3), an invalid data type file is sent by the server as a software patch posting and it is accepted as a patch at the client/target.

h. Allowable indications of the control, status, and results of the test and the readiness for the next test evolution (phase or sequence). As per Paragraph 4.1.2.5.a.

i. Additional Criteria. None

4.1.2.6 PSC(1) & PSO(1) TEST SEQUENCE PROCEDURES

General sequential test steps are listed in Table 2. PSC & PSO oriented steps are listed in Table 4.

a. Test Operator Actions and Equipment Operation. Preparations in accordance with Paragraph 3.2. Implement PSC/PSO in accordance with graphical user interface.

b. Expected Result and Evaluation Criteria. Posted patch at client/target machine. Evaluation criteria as per Paragraph 4.1.2.5.a.

c. Actions to Follow in the Event of a Program Stop or Indicated Error. At the direction of the Test Director.

d. Procedures to be used to Reduce and Analyze Test Results. As per Sub-step 6.9. If possible, run automated comparison between the file derived from Sub-step 6.7 and the file derived from Sub-step 6.8. For Phases 3 and 4, the file derived in Sub-step 6.8 (i.e., the patch file at the server prior to sending "on-line" may be put on a disk (or other media) and prepositioned at CINCPACFLT and/or the designated ship so that, once Sub-step 6.7 (O&R tool derived software patch destined for target machine at target machine, an automated compare (Sub-step 6.9) can be quickly done and the evaluation criteria specified in Paragraph Paragraph 4.1.2.5.a can be applied and reported to the Test Director to aid in test sequencing decisions.

4.1.2.7 PSC(1) & PSO(1) ASSUMPTIONS AND CONSTRAINTS

None.

Table 4 - PSC & PSO Specific Steps

Step		Action
2		Observe & Report (O&R) Pretest Software Configuration of Target Machine to a Level of Detail Consistent with the Posted Install Tool. Note: Preinstall software configuration may be useful in cases where attempts to install software (whether directly or via a posting action) lead to an eventual deinstall action.
6		Provide On-Line Service (PSC or PSO)
	6.1	Commence On-Line Posted Install
	6.2	O&R PSC/PSO Start Time
	6.3	O&R Loading During PSC/PSO <ul style="list-style-type: none"> • Network Loading • Target Machine CPU Loading
	6.4	Complete PSC/PSO
	6.5	O&R PSC/PSO Finish Time
	6.6	O&R Loading Immediately After PSC/PSO <ul style="list-style-type: none"> • Network Loading • CPU Loading
	6.7	O&R Tool Derived Software Patch Destined for Target Machine at Target Machine
	6.8	O&R Tool Derived Software Patch Destined for Target Machine at Server
	6.9	Compare 6.7 and 6.8

4.2 PHASE 2 TEST DESCRIPTION

Phase 2 involves testing machine to machine at NRaD with connectivity external to NRaD.

4.2.1 REMOTE CONFIGURATION SENSING OF ONE MACHINE (1RC(2) & 1RO(2))

Test descriptions for 1RC(2) & 1RO(2) are similar to test descriptions for 1RC(1) & 1RO(1), respectively, in Paragraph 4.1.1.

4.2.2 POSTED INSTALL OF ONE SMALL PATCH (PSC(2) AND PSO(2))

Test descriptions for PSC(2) & PSO(2) are similar to test descriptions for PSC(1) & PSO(1), respectively, in Paragraph 4.1.2.

4.3 PHASE 3 TEST DESCRIPTION

Phase 3 involves testing between a server machine at NRaD and a remote client machine at CINCPACFLT.

4.3.1 REMOTE CONFIGURATION SENSING OF ONE MACHINE (1RC(3) & 1RO(3))

Test descriptions for 1RC(3) & 1RO(3) are similar to test descriptions for 1RC(1) & 1RO(1), respectively, in Paragraph 4.1.1.

4.3.2 POSTED INSTALL OF ONE SMALL PATCH (PSC(3) AND PSO(3))

Test descriptions for PSC(3) & PSO(3) are similar to test descriptions for PSC(1) & PSO(1), respectively, in Paragraph 4.1.2.

4.4 PHASE 4 TEST DESCRIPTION

Phase 4 involves testing machine to machine at NRaD with connectivity external to NRaD.

4.4.1 REMOTE CONFIGURATION SENSING OF ONE MACHINE (1RC(4) & 1RO(4))

Test descriptions for 1RC(4) & 1RO(4) are similar to test descriptions for 1RC(1) & 1RO(1), respectively, in Paragraph 4.1.1.

4.4.2 POSTED INSTALL OF ONE SMALL PATCH (PSC(4) AND PSO(4))

Test descriptions for PSC(4) & PSO(4) are similar to test descriptions for PSC(1) & PSO(1), respectively, in Paragraph 4.1.2.

SECTION 5 - SPECIAL REQUIREMENTS

5.0 SPECIAL REQUIREMENTS OVERVIEW

Minimum testing requirements are specified in Paragraph 3.0. This section discusses additional special testing requirements in terms of:

- Additional test sequences (Paragraph 5.1)
- Special product evaluations that do not lend themselves to traditional testing techniques (Paragraph 5.2).

5.1 SPECIAL REQUIREMENTS ASSOCIATED WITH TEST SEQUENCES

During the course of developing a concept of operations for JMCIS On-Line Services, various special requirements were identified that are of testing interest. Although not critical to the initial demonstration of selected JMCIS On-Line Services envisioned under this test description, these requirements are of value for one or more of the various reasons:

- They Identify Real World Issues to Be Faced in Day to Day Provision of On-Line Services.
- They Provide Insight into Scaling and Organizational Issues.
- They Address Issues of Special Interest to Potential Users of JMCIS On-Line Services.

The Special Requirements addressed in this test description include:

- Variable Communications
- Variable Work Station Configurations at the Remote End
- Variable Size Software Install Patches
- Effect of Firewalls on Remote Sensing
- Heterogeneous Operating Environments (e.g., UNIX and Windows NT).

Special requirements are incorporated into our test plan as described in Tables 5 and 6. The remainder of this paragraph discusses these special requirements in terms of testing the two On-Line services specified in this test description.

As discussed in Paragraph 3.0, successful completion of two basic test sets

- Remote Configuration Sensing of one Remote Machine With Continuous Communications (1RC)
- Posted Install of one Small Patch with Continuous Communications (PSC))

constitutes the minimum requirement for successfully completing a test at each of the four phases. The additional test sequences described below are desirable within the time constraints of the testing process.

5.1.1 SPECIAL REQUIREMENTS ASSOCIATED WITH TESTING FOR REMOTE CONFIGURATION SENSING

The minimum testing requirement for remote configuration sensing is one remote machine (in standard JMCIS configuration) with continuous communications. This test sequence is designated 1RC. Test Sequence 1RC and additional test sequences that address special requirements associated with testing for remote configuration sensing are listed in Table 5 and discussed below.

Table 5 - Remote Configuration Sensing Test Sequences

Remote Machine Configuration	With Continuous Comms	With Comms Outages
One Remote Machine		
Standard Machine	1RC (Note 1)	1RO
Standard Machine with Firewall	1RFC	1RFO
Windows NT Machine	1RWC	1RWO
Multiple Remote Machines		
Fixed LAN/MAN Configuration	MRFC	MRFO
Dynamic LAN/MAN Configuration	MRDC	MRDO

Note 1. Minimum testing requirement.

One Remote Machine with Communications Outages (1RO).

Builds on the minimum testing requirement (One Remote Machine With Continuous Communications (1RC)) to gain insight on the effect of communications outages on remote configuration sensing.

One Remote Machine with Firewall (1RFC & 1RFO)

Investigates the effects of firewalls on remote sensing.

Windows NT Machine (1RWC & 1RWO)

Certain user communities may perform JMCIS operations on non UNIX machines. For example, COMNAVSURFPAC is interested in the ability to use remote sensing for SURFPAC units with Windows NT machines. This test sequence investigates this area of interest. In the future, additional machines may be investigated.

Multiple Machines With Fixed LAN/MAN Configuration (MRSC & MRSO)

Builds on 1RC and 1RO to gain insight on remote configuration sensing when more than one machine is on the remote site local area or metropolitan area network (LAN/MAN). Machine "membership" on the LAN/MAN remains static.

Multiple Machines With Dynamic LAN/MAN Configuration (MRVC & MRVO)

Similar to MRSC & MRSO except that machine "membership" on the remote site LAN/MAN may be dynamic. That is, machines can log on and off the LAN/MAN during the course of the test.

5.1.2 SPECIAL REQUIREMENTS ASSOCIATED WITH TESTING FOR REMOTE SOFTWARE (PATCH) INSTALL

The minimum testing requirement for remote software (patch) install is posted installation of a small patch on one remote machine (in standard JMCIS configuration) with continuous communications. This test sequence is designated PSC. Test Sequence PSC and additional test sequences that address special requirements associated with testing for remote software (patch) install are listed in Table 6 and discussed below.

A "posted" installation involves the posting of a software change onto a workstation at a remote site. This workstation then actually controls the installation on other machines at that site. In this case, NRaD may (in addition to posting the software change) support the software installation by working in a collaborative manner with the remote site workstation controlling the installation. The actual nature of this collaborative support will vary with each remote site. Posted install sequences are designated with a first letter "P".

A "direct" installation involves the direct installation of software from NRaD to a remote machine. Although direct installation raises various control and configuration management issues (that will be further identified and addressed by the NRaD demonstration facility), the ability to provide direct installs (within controls established at the remote site) will greatly enhance the utility of On-Line services. Direct install sequences are designated with a first letter "D".

For both posted and direct installs, "small" and "variable" patches shall be used. For standardized testing purposes, there shall be one small patch selected for use in

each phase. Additional variations to this patch may be made (in terms of size and complexity) to investigate scalability factors.

Table 6 - Remote Software (Patch) Install Test Sequences

Remote Software (Patch) Install	With Continuous Comms	With Comms Outages
<u>Posted Install on One Remote Machine</u>		
Standard Machine	PSC (Note 1)	PSO
Small Patch	PVC	PVO
Variable Patch		
Windows NT Machine		
Small Patch	PWSC	PWSO
Variable Patch	PWVC	PWVO
<u>Direct Install With Remote Machines</u>		
Fixed LAN/MAN Configuration		
Small Patch	DFSC	DFSO
Variable Patch	DFVC	DFVO
Dynamic LAN/MAN Configuration		
Small Patch	DDSC	DDSO
Variable Patch	DDVC	DDVO

Note 1. Minimum testing requirement.

POSTED INSTALLS

Posted Install Of One Small Patch On One Standard Remote Machine with Communications Outages (PSC).

Builds on the minimum testing requirement (Posted Install Of One Small Patch On One Remote Machine with Continuous Communications (PSC)) to gain insight on the effect of communications outages on remote software installations.

Posted Install Of Variable Patch On One Standard Remote Machine (PVC & PVO)

Builds on insight gained from PSC and PSO to investigate scalability factors associated with various size patches (including transfer of increasingly complex files)

Posted Install On Windows NT Machine (PWSC, PWSO, PWVC & PWVO)

Investigates remote software posted onto a Windows NT machine under various conditions of communications and sizes of patches.

DIRECT INSTALLS

Investigates situations where software is directly installed by NRaD on a remote machine.

Fixed LAN Man Configuration (DFSC, DFSO, DFVC & DFVO)

Investigates direct installation when more than one machine is on the remote site local area or metropolitan area network (LAN/MAN). Machine "membership" on the LAN/MAN remains static.

Variable LAN Man Configuration (DDSC, DDSO, DDVC & DDVO)

Similar to DFS* & DFV*, except that machine "membership" on the remote site LAN/MAN may be dynamic. That is, machines can log on and off the LAN/MAN during the course of the test.

5.2 SPECIAL REQUIREMENTS ASSOCIATED WITH PRODUCT EVALUATION

Product evaluation requires a mix of testing and other techniques. One such technique is an official corporate response, signed by a responsible corporate officer, to subject oriented questionnaires.

Three such questionnaires are provided with this test description, as follows:

- Appendix A - Security Evaluation
- Appendix B - Training and Qualification Evaluation
- Appendix C - Support Services Evaluation.

In each appendix, questions are asked. The Government and corporation representing the product under evaluation shall enter into agreement as to who shall sign this response to the questionnaire and the timeline for responding to the questionnaire. Incremental timelines (e.g. draft and final responses) may be appropriate. In addition to answering each question, the respondent shall suggest approaches for an independent validation of each response.

SECTION 6 - NOTES

6.1 ACRONYM LIST

ADP	Automatic Data Processing
AMS	Application Management Specification
CAU	Computer Associates UNICENTER
CINCPACFLT	Commander in Chief, U. S. Pacific Fleet
COMNAVSURFPAC	Commander Naval Surface Force, US Pacific Fleet
COMSEC	Communications Security
COTS	Commercial-off-the-Shelf
CPU	Central Processing Unit
DID	Data Item Description
DMI	Desktop Management Interface
EASTPAC	Eastern Pacific
GCCS	Global Command and Control System
IV&V	Independent Verification & Validation
JMCIS	Joint Maritime Command Information System
JOSDEP	JMCIS On-Line Services Demonstration Plan (JOSDEP)
JOSTED	JMCIS On-Line Services Test Description
JOSTEP	JMCIS On-Line Services Test Plan (JOSTEP)
JWANS	JMCIS WAN Support
MLS	Multi-Level Security
NCCOSC	Naval Command, Control and Ocean Surveillance Center
NCI	NCCOSC Command Internet
NCTAMS	Navy Computer and Telecommunications Area Master Station
NES	Network Encryption System
NLMs	NetWare Loadable Modules
NRaD	NCCOSC Research, Development, Test & Evaluation Division
NT	(Windows) NT
O&R	Observe & Record
OMG	Object Management Group
OPSEC	Operational Security
OSF	Open Software Foundation
PCs	Personal Computers
PTRV	(Phase Tailored) Pre Test Readiness Validation
SIPRNET	Secret Internet Protocol Router Network
SPAWAR	Space and Naval Warfare Systems Command

STEP	Standard Tactical Entry Point
STF	Software Test Description
STP	Software Test Plan
TEP	Tivoli Evaluation Package
TIV	TEP Installation Validation
TME 10	Tivoli Management Environment 10
TMF	TME 10 Framework
TMP	Tivoli Management Platform
TMR	Tivoli Management Region
WAN	Wide Area Network

6.2 TERMINOLOGY

a. Client-Server Relationships

(1) Server. Designates the machine providing the On-Line service from NRaD.

(2) Client. Designates the machine receiving the On-Line service from the NRaD Server. In Tivoli terminology, this "client" machine may in fact serve other machines, particularly on a regional basis. Accordingly, the term "Target" may be used to refer to a machine receiving On-Line service from the NRaD server, if there is possibility of confusion in distinguishing between server and client functions.

b. Test Structure Terminology. See Paragraph 1.4.

APPENDIX A - SECURITY EVALUATION

Product Name:

Name of Respondent:

Position:

Firm:

Phone:

E-mail:

Date:

Signature:

1. How does your product restrict access?
 - a. General access.
 - b. Roles and functions.
 - c. File control.
 - d. Root access.
 - e. Trend analyses.
 - f. Transaction tracking & reporting.
2. How are the communications security (COMSEC) features of your product?
 - a. Stand alone COMSEC.
 - b. Inteorperability with various encrypted connectivities.
 - c. Multi level security.
3. What are the physical security features of your product?

4. What are the operational security features of your product?
5. Threat analysis.
 - a. Have you conducted a threat analysis for activities served by your product?
 - b. Have activities served by your product conducted threat analyses relative to your product?
 - c. Who are the points of contact for the above threat analyses?
 - d. At the unclassified level, what are the summary conclusions of these threat analyses?
6. Propose a test whereby the counter hacking capabilities of your product can be demonstrated. Include in the test a condition in which your product has been used extensively, by a globally distributed community, over a period of 12 months. Provide the proper security classification to any resulting test documents.
7. Summary comments.
8. Proposed approach for independent validation of each of the above responses.

APPENDIX B - TRAINING AND QUALIFICATION EVALUATION

Product Name:

Name of Respondent:

Position:

Firm:

Phone:

E-mail:

Date:

Signature:

1. What are the levels of certification required for operators of your product in the context of providing JMCIS On-Line Services?

2. What training is required to achieve that certification?

a. Training courses:

- (1) Description.
- (2) Location.
- (3) Duration.
- (4) Presentation schedule.
- (5) Content.
- (6) Instructional approach.
- (7) Objective.
- (8) Cost.

- b. Refresher training
 - c. Cadre training
 - d. Certification procedures.
3. If your product is distributed widely, how can the training requirement impact be minimized?
4. Probable operators of your product already have significant training programs in place to meet their operational and maintenance needs. How can the training approach required for your product leverage this existing training infrastructure?
5. Summary comments.
6. Proposed approach for independent validation of each of the above responses.

APPENDIX C - SUPPORT SERVICES EVALUATION

Product Name:

Name of Respondent:

Position:

Firm:

Phone:

E-mail:

Date:

Signature:

1. Describe computer on-line help support provided by your product:
 - a. When work station is in stand alone mode.
 - b. When work station is on the internet.
2. Describe the help desk support provided by your product. If there are different service plans, answer the following for each service plan you consider applicable.
 - a. What are the hours of your help desk?
 - b. What are the service standards?
 - c. What are the results of service standards compliance audits?
 - d. How do you ensure ease of access?
 - e. What information does a caller need?
3. Problem Trouble Reports (PTRs)

- a. What PTR system is available for your product?
 - b. What are your PTR service standards?
 - c. What are the results of service standards compliance audits?
 - d. How do you ensure ease of access?
 - e. What information is required on a PTR?
4. Regarding Software Version Upgrades for your Product.
 - a. What is your upgrade strategy?
 - b. What is your upgrade schedule?
 - c. What is your beta testing policy?
 - d. How do you control the actual installation of an upgrade?
 - e. How do you respond to post install problems?
5. Regards your products interoperability with other products.
 - a. What products from other vendors affect the overall performance of your product?
 - b. What happens when these products change?
6. Summary comments.
7. Proposed approach for independent validation of each of the above responses.